

# PATENT COOPERATION TREATY



## PCT

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2M/2AB09/SR/8	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA416)	
International application No. PCT/EP 03/03987	International filing date ( <i>day/month/year</i> ) 14.04.2003	Priority date ( <i>day/month/year</i> ) 14.04.2003
International Patent Classification (IPC) or both national classification and IPC A01H5/00		
Applicant ENZA ZADEN et al.		

- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 4 sheets, including this cover sheet.  
  
☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).  
  
 These annexes consist of a total of 2 sheets.

- This report contains indications relating to the following items:
  - I ☒ Basis of the opinion
  - II ☐ Priority
  - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - IV ☐ Lack of unity of invention
  - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - VI ☐ Certain documents cited
  - VII ☐ Certain defects in the international application
  - VIII ☐ Certain observations on the international application

Date of submission of the demand  27.10.2004	Date of completion of this report  17.08.2005
Name and mailing address of the international preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer  Kania, T  Telephone No. +49 89 2399-7703  

JC20 Rec'd PCT/PTO 13 OCT 2005

INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT

International application No. PCT/EP 03/03987

## I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

## Description, Pages

1-12 as originally filed

## Claims, Numbers

1-11 received on 15.07.2005 with letter of 14.07.2005

## Drawings, Sheets

1/2, 2/2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	1-11
	No: Claims	
Inventive step (IS)	Yes: Claims	1-11
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-11
	No: Claims	

2. Citations and explanations

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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The present report refers to the following documents cited in the search report:

- D1: OREN-SHAMIR MICHAL ET AL: "Occurrence of the chromoplast protein ChrA correlates with a fruit-color gene in *Capsicum annuum*" PLANT MOLECULAR BIOLOGY, vol. 21, no. 3, 1993, pages 549-554, ISSN: 0167-4412
- D2: DATABASE WPI Section Ch, Week 20327 Derwent Publications Ltd., London, GB; Class A01, page 001, AN 2003-270523 & HU 0 102 964 A (ANTAL ES TARSA BT) 28 January 2003 (2003-01-28)
- D3: WO 01/62075 A (NASH ALLAN ;DNA PLANT TECHN CORP (US)) 30 August 2001 (2001-08-30)
- D4: SIMPSON D J ET AL: "CHROMOPLAST ULTRASTRUCTURE OF CAPSICUM CAROTENOID MUTANTS PART 2 EFFECT OF LIGHT AND 2-4 CHLOROPHENYLTHIOETHYLDIETHYL AMMONIUM CHLORIDE" ZEITSCHRIFT FUER PFLANZENPHYSIOLOGIE, vol. 83, no. 4, 1977, pages 309-326, ISSN: 0044-328X

**Subject-matter of the application**

The application relates to a method for the production of *Capsicum* the fruit of which has increased sugar and ascorbic acid content. The method comprises the creation of plants homozygous for the recessive alleles at the loci *cl* and *y*. Both loci were formerly thought to be involved in colour formation of the peppers. Varieties "Evergreen 7181" and "Evergreen 6203" are produced by conventional breeding.

**Re Item V: Novelty and Inventive step**

The method according to claims 1-11 has not been disclosed or fairly suggested in any of the cited prior art documents D1-D4.

In consequence, the subject-matter of all present claims is regarded as novel and inventive according to **Article 33 PCT**.

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## NEW CLAIMS

1. Method for enhancing the "taste" and/ or  
nutritional value of fruits of a plant of the genus Capsicum  
5 by manipulation of the CL and the Y loci.

2. Method according to claim 1, wherein the  
manipulation results in providing a plant of the genus  
Capsicum, comprising two recessive y alleles and two  
10 recessive cl alleles.

3. Method according to claim 2, wherein the y allele  
is derived from a plant chosen from the group consisting of  
Capsicum annuum, Capsicum baccatum, Capsicum frutescens,  
15 Capsicum chinense, and Capsicum chacoense, preferably  
Capsicum annuum.

4. Method according to claim 2, wherein the recessive  
cl allele is derived from a plant chosen from the group  
20 consisting of apsicum annuum, Capsicum baccatum, Capsicum  
frutescens, Capsicum chinense, and Capsicum chacoense,  
preferably Capsicum annuum.

5. Method according to claims 1-4, wherein the  
25 enhanced nutritional value is characterized by an enhanced  
sugar content in the fruits of the plant relative to the  
fruits of a similar type plant of the genus Capsicum.

6. Method according to claim 5, wherein the plant is  
30 characterized by a sucrose content which is at least 1.5  
times higher than the sucrose content of fruits of a plant of  
the genus Capsicum of a similar type.

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7. Method according to claim 6, wherein the plant of the genus Capsicum is characterized by a sucrose content of the fruits of more than 5, preferably 5 to 40, more preferably 5.4 to 16.8 grams per kilogram fresh weight.

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8. Method according to claims 1-7, wherein the enhanced nutritional value is characterized by an enhanced ascorbic acid content in the fruits of the plant relative to the fruits of a similar type plant of the genus Capsicum.

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9. Method according to claim 8, wherein the plant is characterized by an ascorbic acid content which is at least 1.3 times higher than the ascorbic acid content in fruits of a plant of the genus Capsicum of a similar type.

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10. Method according to claim 9, wherein the plant of the genus Capsicum is characterized by an ascorbic acid content of the fruits of more than 2, preferably 2 to 7, more preferably 2.1 to 2.85 grams per kilogram fresh weight.

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11. Method according to claims 1-10, wherein the plant is "Evergreen 7181", "Evergreen 6203".

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